ABSTRACT OF THE DISCLOSURE

A temperature to digital converter device is implemented by integrating a temperature sensor circuit into an analog-to-digital converter (ADC). Temperature-to-digital conversion is accomplished by first measuring a change in voltage (ΔV_{BE}) across the junction of a diode when different current densities are forced through the junction. The thus obtained ΔV_{BE} is proportional to temperature. As part of the conversion processing, ΔV_{BE} is multiplied by a fixed gain, and an offset voltage value is subtracted from ΔV_{BE}. The multiplication and subtraction functions are performed by a switched-capacitor integrator in a delta-sigma ADC and the ADC itself operates as the temperature-to-digital converter device, eliminating the extra amplifier and/or capacitors required when the multiplication and/or subtraction function are performed outside the ADC. Alternately, other ADC topologies that include an integrator or gain amplifier, such as pipeline ADCs and cyclic ADCs may be used in place of the delta-sigma ADC.